

OPERATING SUMMARY

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CORNWALL

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CORNWALL

ST. LAWRENCE RIVER

WATER POLLUTION CONTROL CENTRE NO. 1

MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY



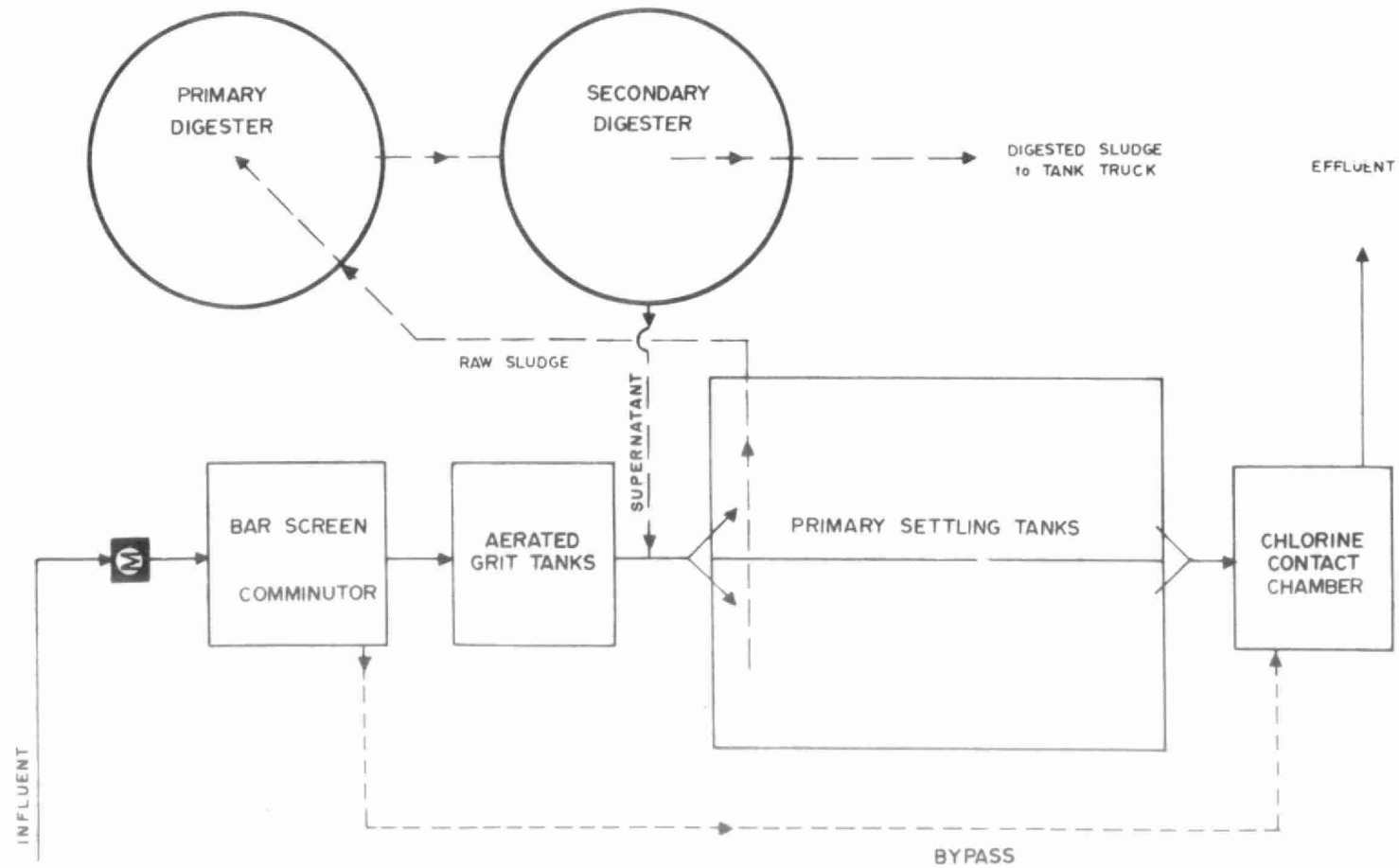
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CORNWALL
WATER POLLUTION CONTROL PLANT



DESIGN DATA

PROJECT NO.	1-0001-66	<u>PRIMARY TREATMENT</u>	<u>CHLORINATION</u>
DESIGN FLOW	8.25 mgd	<u>Comminution</u>	<u>Chlorinator</u>
DESIGN POPULATION	66,000	Type: Barminutor Size: Two Type "C"	Type: W & T Size: One 2,000 lb/day with evaporator
		<u>Screening</u> (Bypass channel)	<u>Chlorine Contact Chamber</u>
		Size: 2" spaces	Size: One 48' 7" x 26' 11" x 10' 6" (85,800 gal)
		<u>Grit Removal</u>	Retention: 15 min
		Type: Aerated; grit removed by clamshell bucket	<u>OUTFALL</u>
		Size: Two 38' 6" x 15' 10" x 13' 5" swd (98,500 gal)	- to St. Lawrence River
		Retention: 17 min	<u>SLUDGE HANDLING</u>
		<u>Air Supply</u>	<u>Digestion System</u> - Two-stage
		Type: Hoffman	Primary Digester -
		Size: Two 1,100 scfm (also for channel aeration)	Type: Perth (gas mixed) with fixed concrete cover
			Size: One 65' dia x 24' swd (82,500 cu ft or 0.515 mil gal)
			Loading: 2.88 lb/cu ft/mo
		<u>Primary Sedimentation</u>	Secondary Digester -
		Type: Jeffrey	Size: One 65' dia x 24' swd (82,500 cu ft or 0.515 mil gal)
		Size: Two 143' x 48' x 12' (1.245 mil gal)	Total Loading: 1.44 lb/cu ft/mo
		Retention: 3 hours	<u>Disposal</u>
		Loading: Surface, 600 gal/ft ² /day	- by tank truck
		Weir, 14300 gal/ft/day	

'73 Review

GENERAL

Problems with industrial waste were encountered during the past year. One industry was installing new equipment to rectify the problem. The other industry however, did not appear to make efforts that would eliminate perlite discharges to the sewer. The perlite material is a very abrasive material that is inorganic and very bouyant. It created additional operating costs because of the necessity of its manual removal from the primary tanks, and additional maintenance costs because of the wear and tear caused to the equipment by pumping it. The cost of removing this material from the clarifiers from April 1, 1973 to December 31, 1973 was \$5,745.00. These costs have been reported to the City of Cornwall so that the City may be reimbursed from the industry.

A new recirculating pump was installed at the sewage treatment plant: excessive wear due to the perlite caused its premature replacement.

All new piping and a new unit heater were installed in the chlorine room building.

Temporary permission was granted to dispose of processed organic waste on the City of Cornwall's landfill site. Concentrated efforts were continued to find a satisfactory sludge spreading and lagoon site.

All other repairs undertaken at the plant were of a minor nature.

PLANT PERFORMANCE

Flows for the year totalled 4017 million gallons, up from 3601 million gallons during the previous year. The average daily flow increased from 9.8 million gallons per day in 1972 to 11.0 million gallons per day in 1973.

The sewage BOD was reduced by 7 per cent from an influent concentration averaging 140 mg/l to an effluent concentration of 130 mg/l. The sewage suspended solids was reduced by 39 per cent from an influent concentration averaging 160 mg/l to an effluent concentration of 98 mg/l.

Phosphorus concentrations averaged 3.2 mg/l in the influent and 3.3 mg/l in the effluent.

A total of 6.3 million gallons of raw sludge was pumped to the digestors and 2.3 million gallons of digested sludge, plus 1,134 cubic feet of grit were removed from the plant by truck.

The plant effluent was disinfected with a total of 228 thousand pounds of chlorine.

PLANT LOADING

Flows during 1973 averaged 33 per cent above design capacity up from 19 per cent above design capacity in 1972.

CONCLUSIONS

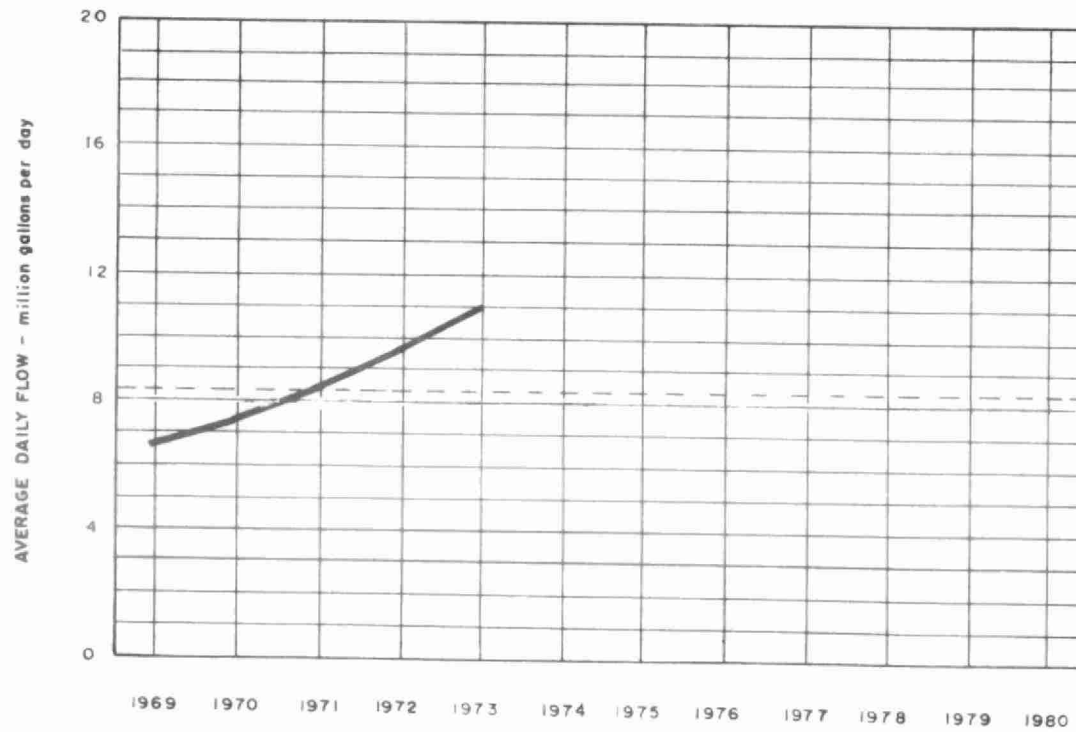
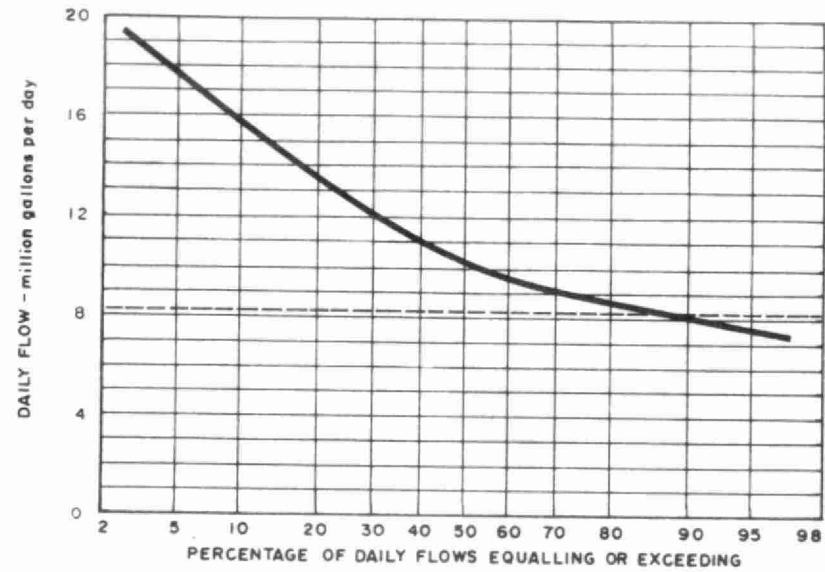
The plant effluent quality during 1973 was considerably below average as the BOD reduction was very low and the phosphorus reduction was nil. The cause of this inefficiency was a result of the high hydraulic loading (33 per cent above the average design capacity) and industrial waste discharges. It should also be noted that the average maximum daily flow was 21.2 million gallons per day.

It is recommended that a consulting engineering firm be retained to prepare a report on the expansion of the Cornwall Water Pollution Control Plant.

The plant Superintendent, Mr. Bill Girard and his capable staff are to be commended for their high standards of operation and maintenance.

PROCESS DATA

FLOWS

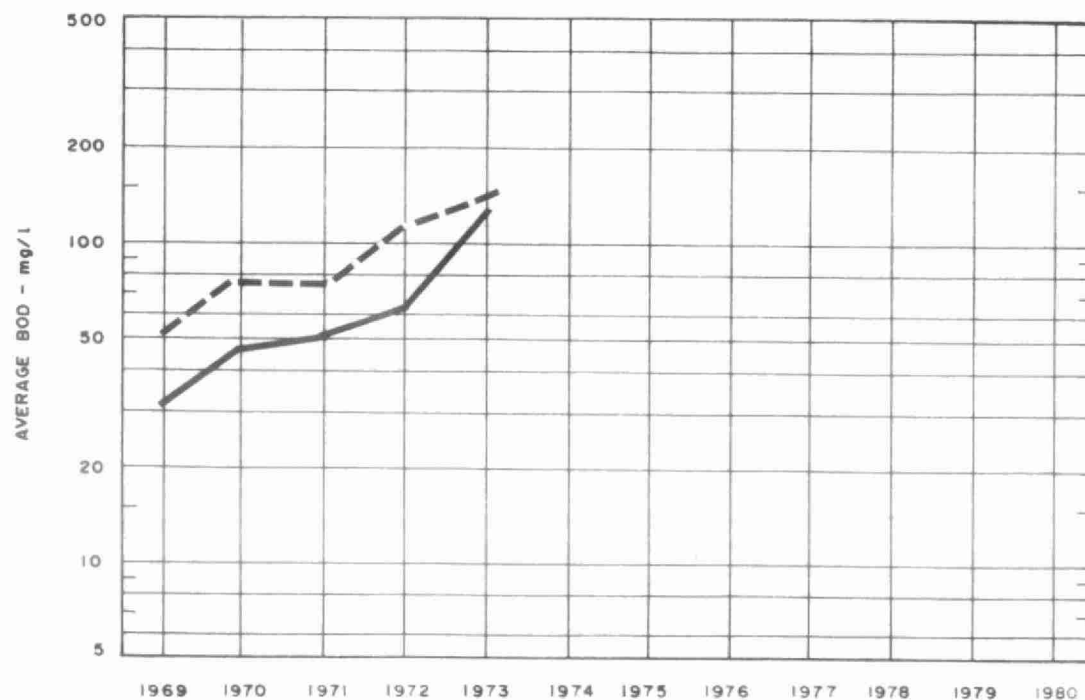
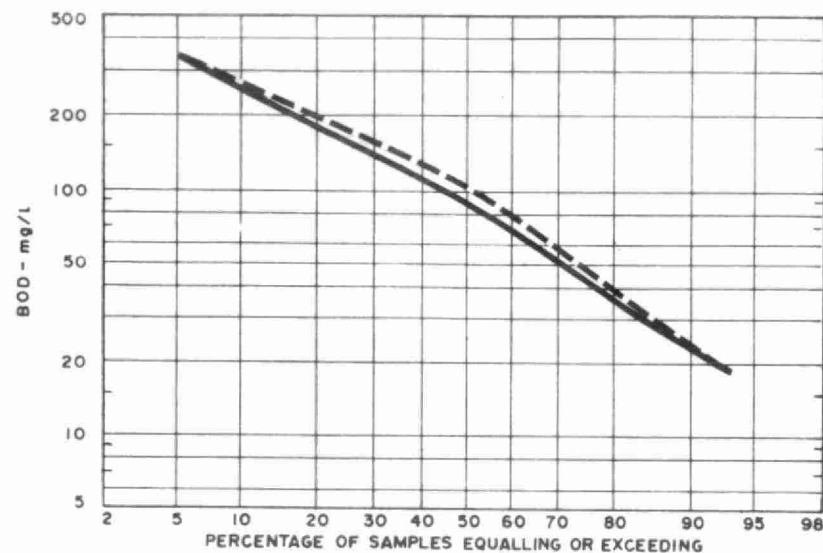


DESIGN CAPACITY - - - - -

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10 ³ pounds	mg/l	mg/l	%	10 ³ pounds	mg/l P	mg/l P
JAN	352.7	11.4	19.7	200	220	0	0	120	53	55	229	3.8	4.5
FEB	249.3	8.9	14.3	220	170	23	125	170	100	42	182	4.6	3.3
MAR	459.6	14.8	21.2	65	60	8	23	170	110	37	290	1.4	
APR	390.5	13.0	20.0	22	22	0	0	140	98	31	168	1.1	1.1
MAY	396.9	12.8	18.0	140	110	23	131	130	140	0	0	2.8	2.7
JUNE	327.8	10.9	19.2	85	68	20	56	280	130	54	49	3.9	4.3
JULY	274.5	8.9	11.5	320				190	110	44	233	3.8	
AUG	277.6	9.0	13.3	85	70	18	42	160	68	68	244	3.2	2.6
SEPT	320.2	10.7	16.9	130	130	0	0	200	90	54	336	3.5	3.0
OCT	313.0	10.1	18.0	80	85	0	0	170	89	48	253	3.5	4.2
NOV	311.4	10.4	13.2	140	300	0	0	160	90	45	233	2.8	2.8
DEC	343.8	11.1	17.6	160	240	0	0	210	80	62	440	3.6	3.6
TOTAL	4017.3	-	-	-	-	-		-	-	-	2657	-	-
AVG.		11.0	MAXIMUM 21.2	140	130	7	34	160	98	39	221	3.2	3.3
No. of Samples	-	-	-	14	13	-	-	87	85	-	-	16	14

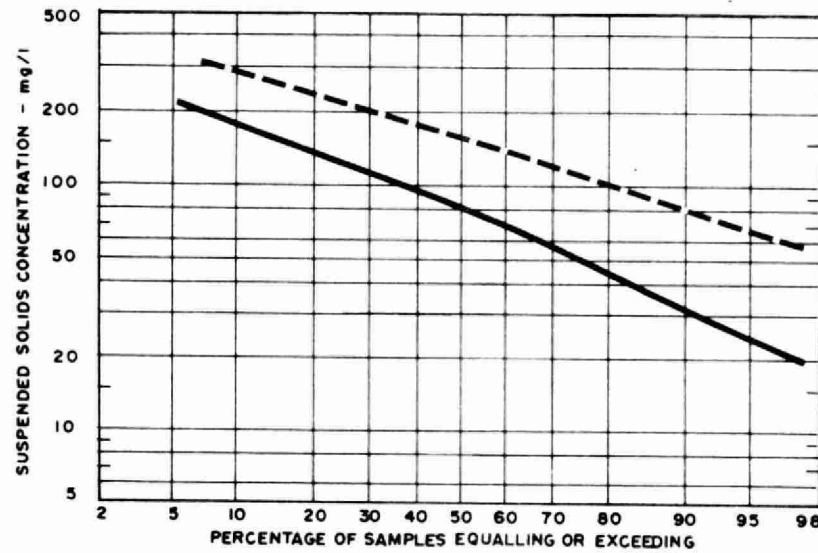
BIOCHEMICAL OXYGEN DEMAND



PLANT INFLUENT - - - - -

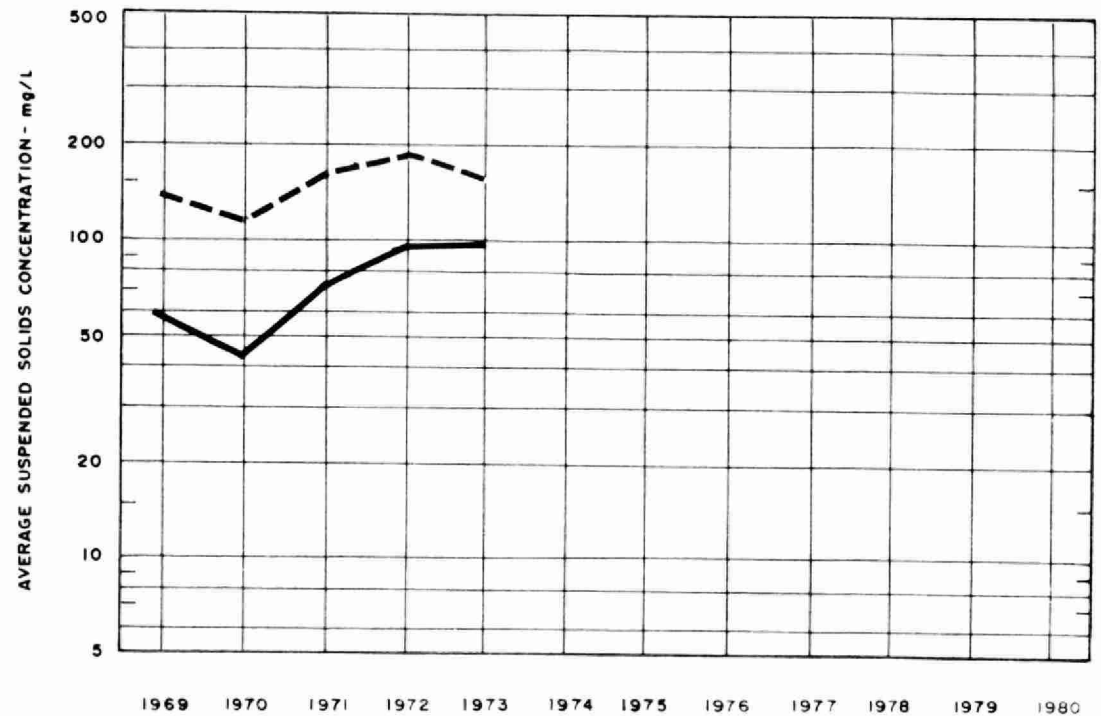
PLANT EFFLUENT —————

SUSPENDED SOLIDS

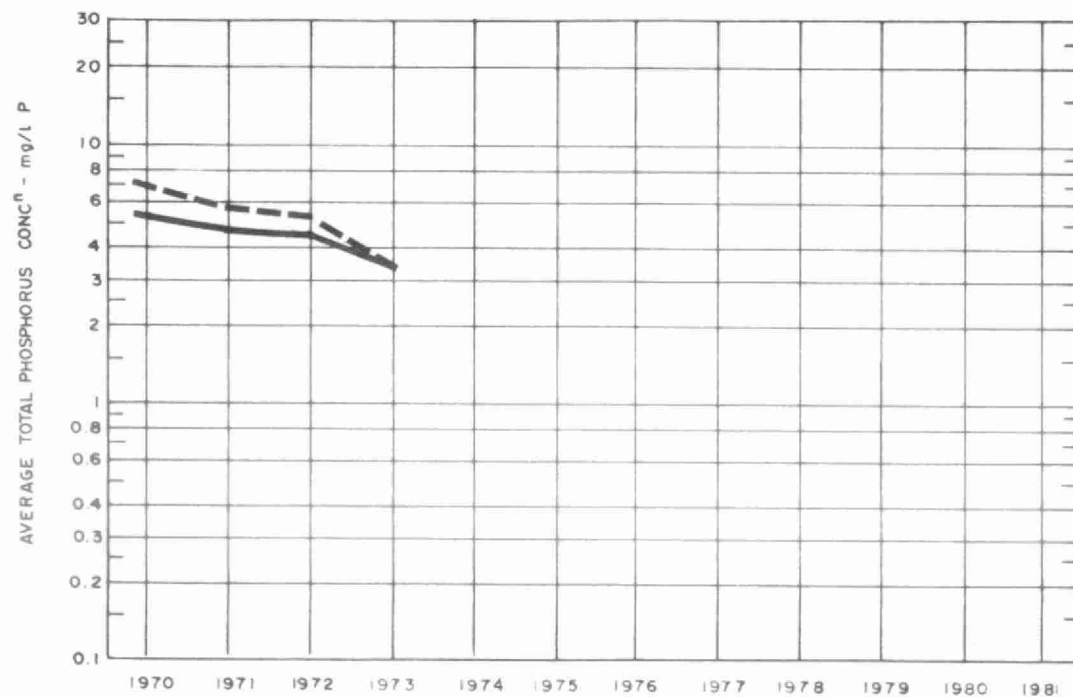
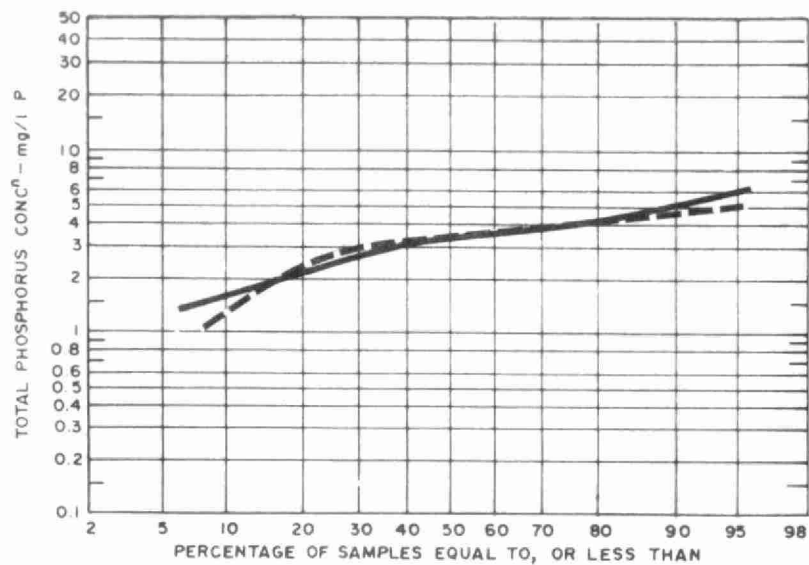


PLANT INFLUENT - - - - -

PLANT EFFLUENT _____



PHOSPHORUS

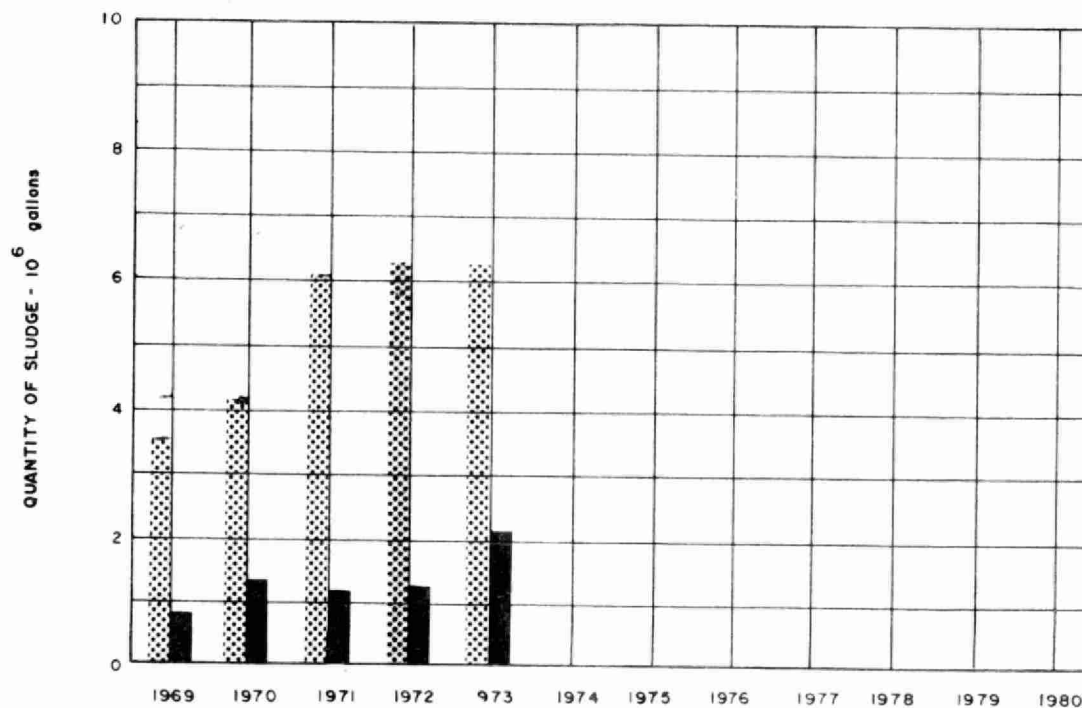
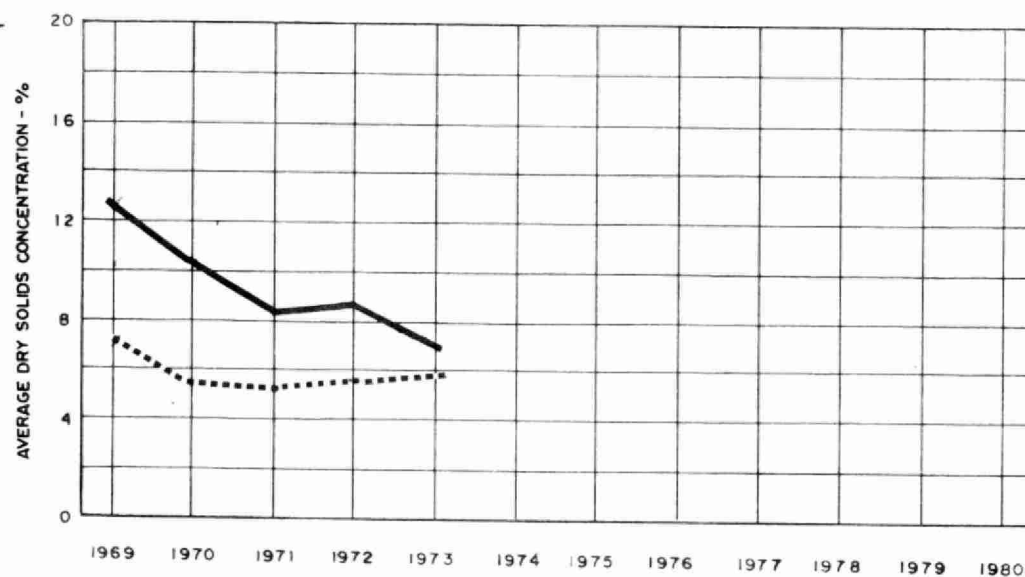


PLANT INFLUENT - - - - -

PLANT EFFLUENT —————

DIGESTION

RAW SLUDGE
DIGESTED SLUDGE ———

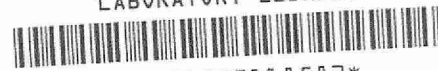


RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED ———

TREATMENT DATA

MONTH	GRIT	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
	QUANTITY REMOVED cubic feet	CHLORINE USED 10 ³ pounds	AVERAGE DOSAGE mg/l	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT	SLUDGE HAULED cubic yards
				QUANTITY 10 ³ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED 10 ³ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	TOTAL SOLIDS %	
JAN		16.8	4.8	442	4.0	64	102	6.7		1.7	609
FEB	378	16.6	6.6	447	4.6	59	120	7.9	46	0.1	714
MAR		21.9	4.8	522	6.0	44	171	5.7	40	0.1	1015
APR	63	18.9	4.8	456	5.2	60	177	4.5	41		1050
MAY	252	20.9	5.3	546	4.4	66	169	7.7		0.8	1001
JUNE		17.9	5.5	500	5.5	51	194	8.9	37	0.2	1150
JULY		19.8	3.4	527	5.5	60	216	7.1	35	1.6	1284
AUG		19.1	6.9	602	5.2	53	253	7.7	53	1.2	1500
SEPT	126	18.6	5.8	574	4.6	60	216	7.9		0.1	1284
OCT	315	18.1	5.8	544	4.3	64	247	6.3	47	1.6	1464
NOV		20.2	6.5	535	4.4	65	222	6.7			1319
DEC		19.5	5.7	628	4.8	65	171	7.0		0.1	1015
TOTAL	1134	228.3	—	6323	—	—	2258	—	—	—	13405
AVG.	0.3 cubic feet/mil gal	19.0	5.7	527	4.9	59	188	7.0	43	0.8	1117

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